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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,946	06/29/2005	Koichi Sato	03500.018117	3824

5514 7590 04/10/2008

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EXAMINER	
BERNSHTEYN, MICHAEL	
ART UNIT	PAPER NUMBER
1796	
MAIL DATE	DELIVERY MODE
04/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,946	SATO ET AL.	
	Examiner	Art Unit	
	MICHAEL M. BERNSHTEYN	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,8,14 and 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,8,14 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action follows a response filed on January 4, 2008. Claims 7 and 8 have been amended; claims 1-6 and 9-13 have been cancelled without prejudice; claims 14 and 15 have been added.

2. In view of the amendment(s) and remarks, the objection of the specification and the rejection of claims 3 and 4 under 35 U.S.C. 102(b) and the rejection of claims 5-8 under 35 U.S.C. 103(a) have been withdrawn.

3. Applicant's arguments with respect to claims 3-8 have been considered but are moot in view of the new ground(s) of rejection.

4. Claims 7, 8, 14 and 15 are pending.

Double Patenting

5. The text of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.

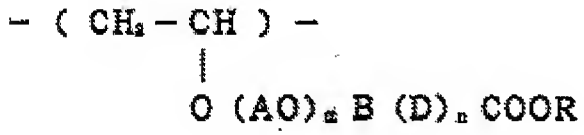
6. Claims 7 and 8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of copending Application No. 11/118,401, for the rationale recited in paragraph 9 of Office Action dated October 4, 2007.

Claim Rejections - 35 USC § 103

7. The text of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.

8. Claims 7, 8, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable as obvious over Sato et al. (EP 1 357 138 A1) in view of Percec et al. (V. Percec and H. Oda "Molecular Engineering of Liquid-crystalline Polymers of 'Living" Polymerization. Part 31. Synthesis and 'living' cationic polymerization of (2R, 3S)-2-fluoro-3-methylpentyl 3-fluoro-4'- (ώ-vinyloxyalkoxy) biphenyl-4-carboxylate with undecanyl and octyl alkyl groups, J. Mater. Chem., 1995, 5(8), 1125-1136).

With regard to the limitations of claims 7, 8 and 14, Sato discloses a composition containing a polymer compound and medium being a solvent or a binder resin, wherein the polymer compound comprises monomer units represented by general formula (1):



wherein A is a straight-chain or branched alkylene group of 1 to 15 carbon atoms, which may be substituted; m is an integer of 0 to 30, and B is a single bond or alkylene, which may be substituted; D is an aromatic ring structure; n is an integer of 1 to 10, and R is a hydrogen atom, an alkyl group, which may be substituted, an aromatic ring structure, or a mono- or polyvalent metal cation (abstract).

With regard to the limitations of claim 8, Sato discloses that each segment in the block polymer compound may be composed of a single monomer unit, or 2 or more monomer units. Moreover, the block polymer compound may be a di-, **tri- or tetra-block polymer** or higher. It may be also a block polymer graft-bonded to another polymer (page 49, [0153]). One of the favorable properties, which the block polymer

compounds are expected to exhibit, is an amphipathic property. This property can be realized by providing **the compound with hydrophobic and hydrophilic block segments simultaneously.** The block polymer compound can form a micellar condition in an aqueous solvent, when it is amphipathic. In such a case, the amphipathic polymer compound has properties desirable properties for recording materials (page 49, [0150]).

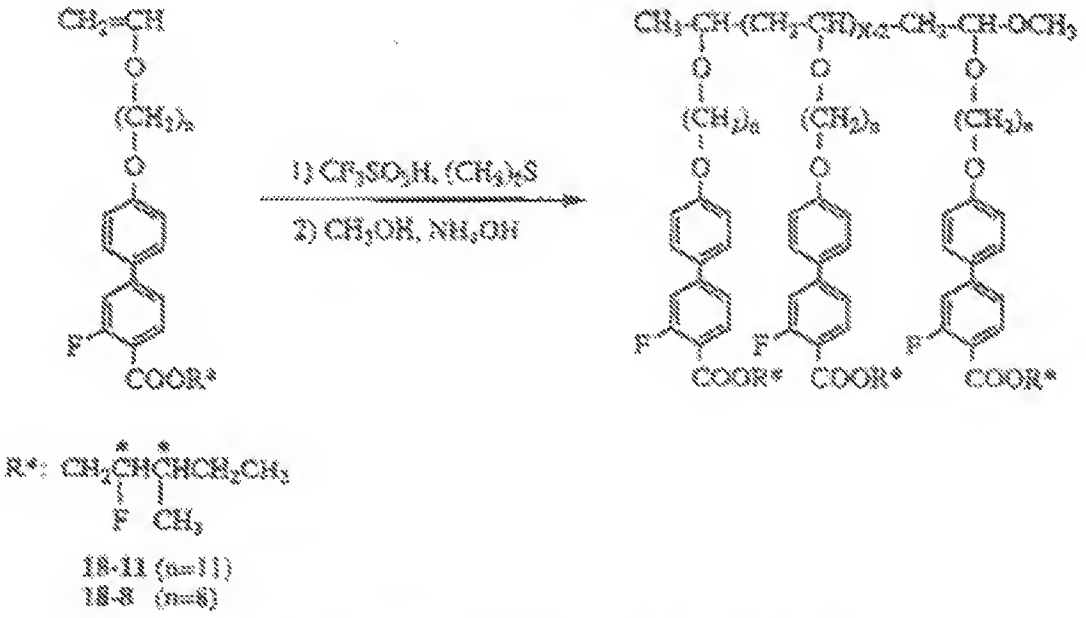
Sato discloses that the polymer compound is preferably a block compound, wherein the block polymer has a polyvinyl ether monomer unit selected from the group consisting of a carboxylate ester, carboxylic acid or carboxylate (page 21, [0045] and [0049]). The block polymer compound has a block segment comprised of monomer units represented by general formula (1), and at least one block segment different from the above segment (page 47, [0138]).

The obtained polymers, copolymers and block polymers are substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I); the only difference is that the claimed polymer compound contains D which represents an aromatic ring in which at least one hydrogen atom attached to the ring is displaced by a fluorine atom as recited in claim 7 or wherein four of the hydrogen atoms attached to the aromatic ring represented by D are each displaced by fluorine atoms.

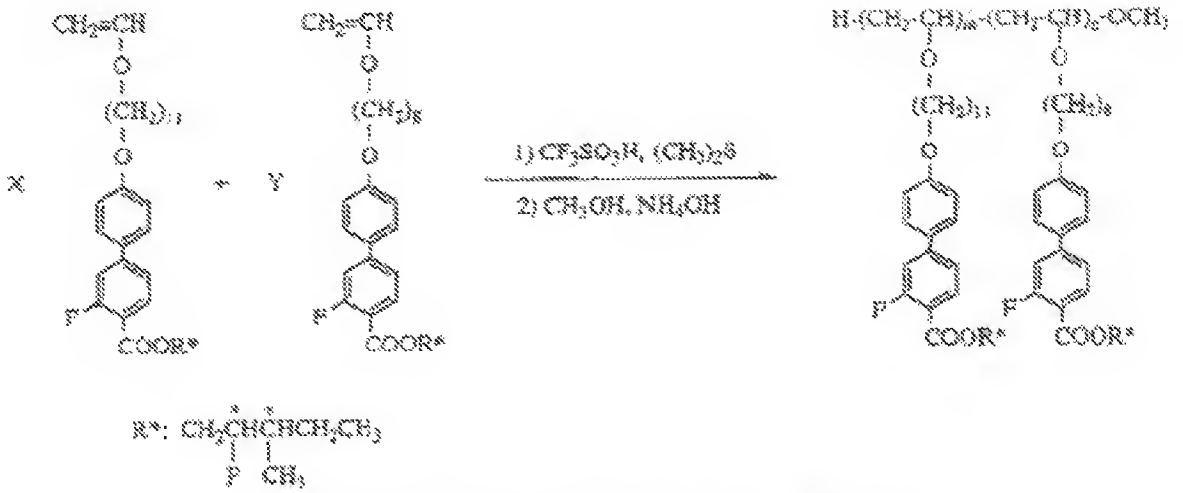
Percec discloses the synthesis and living cationic polymerization of (2R, 3S)-2-fluoro-3-methylpentyl 3-fluoro-4'- (11-vinyloxyundecanyloxy) biphenyl-4-carboxylate (18-11) and (2R, 3S)-2-fluoro-3-methylpentyl 3-fluoro-4'- (8-vinyloxyoctyloxy) biphenyl-4-carboxylate (18-8). Poly(18-11)s and poly(18-08)s with degrees of polymerization (DP)

from 4.5 to 16.7 and polydispersities less than 1.22 were synthesized and characterized and characterized by differential scanning calorimetry (DSC) and thermal optical polarized microscopy (abstract).

Percec discloses that the effect of **fluorine substitution** on mesomorphic phase behavior has been investigated for a number of different low-molar-mass liquid-crystalline compounds by replacing hydrogen with fluorine in the mesogenic group (col. 1, page 1125). Percec discloses the synthesis of monomers, the cationic polymerization (schema 2) and copolymerization of 18-11 and 18-08 (schema 3) (page 1129 and 1134).



Scheme 2 Cationic polymerization of 18–11 and 18–8



Scheme 3 Cationic copolymerization of 18–11 with 18–8

The obtained polymers and copolymers are substantially identical to the instantly claimed polymeric compound having a repeated unit represented by the formula (I).

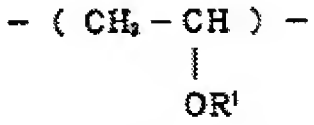
Therefore, in view of substantially identical polymer compounds it would have been obvious to one having ordinary skill in the art at the time the invention was made to obtain the claimed block polymer comprising a polyalkenyl ether repeating unit comprising an aromatic structure having a fluorine atom in a side chain thereof in at least one block segment using Perces's fluorinated monomers because fluorine-containing structure can increase and reinforce the lateral interaction of molecules owing to the dipole moment acting across the molecular long axes, giving rise to the formation of stable amectic mesophases (page 1125, the left column). Introduction of fluorine into the *ortho* position to the terminal chiral tail suppresses all the transition temperatures, whereas the thermal stability of the phases is greatly increased. These results seem to demonstrate the outer edge effect of lateral fluorine substitution (page

1135, the left column), and thus to arrive at the subject matter of instant claims 7, 8 and 14.

Furthermore, it is worth to mention that "An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound, in the expectation that compounds similar in structure will have similar properties." ***In re Payne***, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 979). See ***In re Papesch***, 315 F.2d 381, 137 USPQ 43 (CCPA 1963) (discussed in more detail below) and ***In re Dillon***, 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1991) (discussed in MPEP § 2144) for an extensive review of the case law pertaining to obviousness based on close structural similarity of chemical compounds. See also MPEP § 2144.08, paragraph II.A.4 (c).

With regard to the limitations of claim 15, Sato discloses the monomer unit constituting the block segment different from that represented by formula (1) is preferably represented by general formula (11), which is substantially identical to the claimed formula (8) (page 47, line 54 through page 48, line 14, [0139]):

General Formula (11)



wherein R^1 is selected from the group consisting of a straight, branched or cyclic alkyl group of 1 to 18 carbon atoms.

Ph, Pyr, Ph-Ph, Ph-Pyr, $-(CH(R^2)-CH(R^3)-O)_p-R^4$ and $-(CH_2)m-(O)_n-R^4$, where the aromatic ring may be substituted with a straight or branched alkyl group of 1 to 4 carbon atoms, and carbon atom in the aromatic ring may be replaced by nitrogen atom;

p is an integer of 1 to 18, m is an integer of 1 to 36, and n is 0 or 1;
R^2 and R^3 are each independently a hydrogen atom or CH_3;
R^4 is selected from the group consisting of hydrogen atom, a straight, branched or cyclic alkyl group of 1 to 18 carbon atoms, Ph, Pyr, Ph-Ph, Ph-Pyr, -CHO, $-CO-CH=CH_2$, $-CO-C(CH_3)=CH_2$ and $-CH_2COOR^7$, and when R^4 is other than hydrogen atom, the hydrogen atom bound to the carbon atom may be replaced by a straight-chain or branched alkyl group of 1 to 4 carbon atoms, or F, Cl or Br, and the carbon atom in the aromatic ring may be replaced by nitrogen atom;
R^7 is hydrogen atom, or an alkyl group of 1 to 4 carbon atoms; and
Ph is phenyl group, and Pyr is pyridyl group.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Response to Arguments

10. Applicant's arguments filed on January 4, 2008 regarding double patenting rejection have been fully considered but they are not persuasive.

In response to applicant's argument regarding double patenting rejection that the claimed polymer compound contains D which represents an aromatic ring in which at least one hydrogen atom attached to the ring is displaced by a fluorine atom, and none of the claims of '401 Application recite such an aromatic ring (page 6, 4th paragraph), please, see the explanations in paragraph 8 of current Office Action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL M. BERNSHTEYN whose telephone number is (571)272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael M. Bernshteyn/
Examiner, Art Unit 1796

/M. M. B./

Examiner, Art Unit 1796

/Randy Gulakowski/

Supervisory Patent Examiner, Art Unit 1796